
CROSS-SECTION SENSITIVITY ANALYSIS FOR THE WATER-COOLED LITHIUM LEAD TEST BLANKET MODULE IN ITER-FEAT

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The differential operator perturbation technique implemented in the three-dimensional Monte Carlo radiation transport code MCNP-4C has been applied to the EU water-cooled lithium lead (WCLL) test blanket module (TBM) integrated in ITER-FEAT in order to assess changes in some parameters due to changes in nuclear cross section data.

The TBM uses Li17Pb83 as a tritium breeder with 90

Sensitivity profiles and integral sensitivities of tritium production rate for partial cross sections of Pb, Fe and 6Li have been obtained. Relatively small sensitivities to the cross sections considered have been observed.

Sensitivity profiles of radiation damage responses (He, H production) in iron and chromium isotopes to their own cross sections (direct contribution) show that the sensitivity is concentrated in the higher (13.5–14.5 MeV) energy region where high (> 1) sensitivity is found. Calculations of sensitivity to important transport cross sections are in progress.

An examination of the provided sensitivity profiles will aid to identify the most important energy ranges for the cross sections under study. Combined with covariance data the sensitivity profiles help to indicate which reaction cross sections and energy ranges need additional measurements and evaluations in order to satisfy the design parameters criteria.